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Improving access to transport in developing countries

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**Improving access and mobility of people with disabilities
is an essential component of the alleviation of poverty in
developing countries. Disabled people are among the
most socially excluded members of society and poorly
designed and inaccessible transport can contribute to this
situation by restricting access to education and health
facilities and employment opportunities. This paper sum-
marises the first phase of a Department for International
Development (DFID) funded project which identifies the
barriers experienced by disabled people when using public
transport services in urban areas of the developing world.**

1. DISABILITY IN THE DEVELOPING WORLD

Figures on the incidence and causes of disability in the
developing world are generally unavailable. The European
Commission (Reference 1, p. 4) estimates that approximately
10% of people in the European Union have some form of
disability (vision, hearing, physical and/or cognitive). It is likely
that the percentage affected in the developing world is at least
as high, given that there are additional causes of disability.
These include malnutrition, increased road accidents, limited
access to vaccination programmes and to general health and
maternity care, poor hygiene, bad sanitation, armed conflict
and landmines.[2] Disability is related to all ages although the
elderly are more likely to suffer from a disability such as a
hearing or sight impairment or difficulty in walking.

The immense impact of HIV/AIDS throughout the developing
world has also meant families are increasingly reliant on older
family members to remain mobile, even if they have a
disability, so that they can be economically active and care for
young orphaned relatives.

2. POVERTY AND DISABILITY: A VICIOUS CIRCLE

Recent World Bank estimates suggest that people with dis-
abilities account for as many as one in five of the world's
poorest.[3] In developing countries, disability is both a cause and
a consequence of poverty, resulting in a cycle of exclusion (see
Fig. 1), which prevents access to both amenities and opportu-
nities. It can be extremely difficult for disabled people to gain
access to employment in developing countries, leading to
greater poverty. In India, for example, the rate of employment
of disabled people in the top 100 companies is only 0·4%.[5]
Limited access to education reduces the possibility of employ-
ment. In India, nearly 50% of disabled people have never been
to school.[6] Ninety-five per cent of disabled Mozambicans are

illiterate, compared to 60% in the overall population.[7] Strong
social and cultural attitudes further isolate and exclude disabled
people from society. Women with disabilities often suffer a
double discrimination in that women in developing countries
generally have a lower status than males. In Malawi, for
example, female-headed households are among the poorest in
the country.

Getting around as a disabled person can be particularly difficult
in developing countries because of a lack of mobility aids and
rehabilitative services. In India, for example, it is estimated that
only 5% of people with physical disabilities receive wheelchairs
and other devices that they need to aid their mobility.

Given the strong link between disability and poverty, if
international targets on reducing poverty[8] are to be reached
then it is critical that measures be taken to include disabled
people in mainstream society.

3. THE VITAL ROLE OF TRANSPORT

Inaccessible transport can make it especially difficult for
disabled people to find employment and to gain an education,
as well as limiting their social and recreational experiences. In
addition, poverty ensures that disabled people are least likely to
be able to afford to live in areas with easy access to social
services. Thus, when the need arises, disabled people should be
able to travel locally, or within urban and suburban areas using
public transport and other modes with ease. Sadly, however,
in the developing world this is the exception rather than the
norm.

In developing countries there are generally limited features in
the transport chain (from origin to destination) to facilitate
access for disabled people. This is partly caused by funding
issues but a lack of awareness means that where features are
included, they are not always appropriate to the needs of
disabled travellers. For example, thousands of kerb ramps have
been installed in South African cities to provide easier access to
footpaths, yet many of these are rendered non-functional by
steep slopes or barriers such as inappropriately placed garbage
bins or street vendors who set up stalls and market goods to
generate an income.

4. IDENTIFYING THE NEEDS

TRL Limited, in collaboration with CSIR Transportek, South
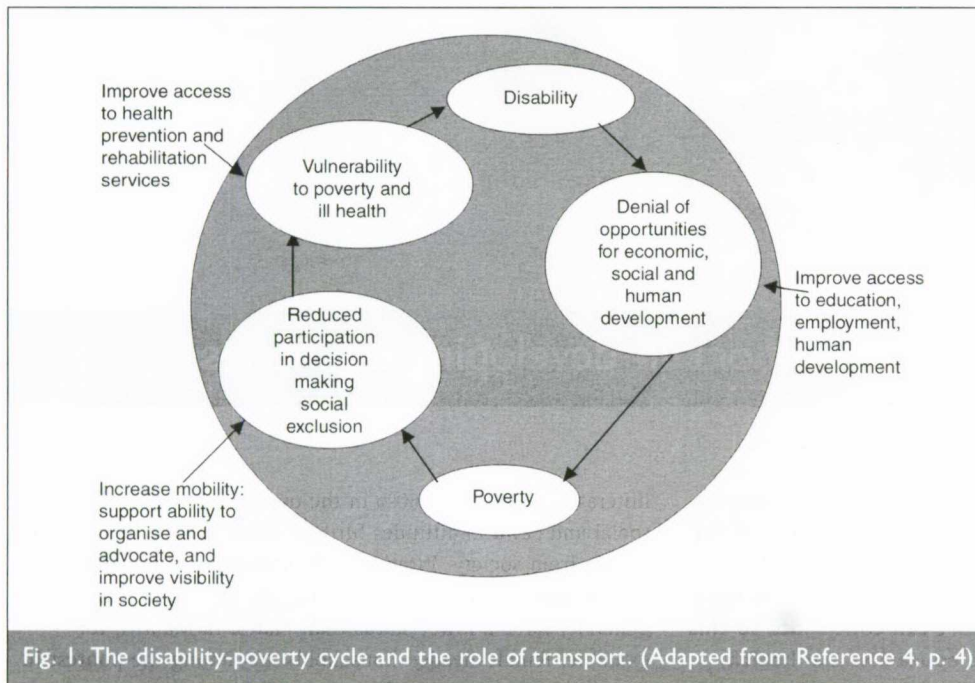Africa, the Central Institute of Road Transport, India, the

Fig. 1. The disability-poverty cycle and the role of transport. (Adapted from Reference 4, p. 4)

Some wheelchair users transferred from their chairs and were either carried into the vehicle or crawled in themselves but problems were still experienced in finding space to stow the wheelchair. Entrances to train coaches were often barred by narrow openings and level changes between the platform and the floor (see Fig. 3).

Smaller vehicles such as minibus-taxis operated in many African countries (see Fig. 4) and six-seater autorickshaws in India (Fig. 5) appear to offer somewhat better accessibility than conventional buses, as these vehicles have lower steps, more space to accommodate a folding wheelchair (at off-peak times) and provide an almost door-to-door service in many cases.

University of Malawi, Access Exchange International, United States, and the Eduardo Mondlane University, Mozambique, are being funded by the Department for International Development (DFID) (see DFID website for project reports and information—www.transport-links.org) to identify the barriers to accessible transport for disabled people and to recommend improvements in the transport chain. The final output of the three-year study will be a Compendium of Guidelines and Standards that in part will be based on the implementation and feedback of demonstration projects being undertaken as a component of the project in India, Mozambique, Malawi and South Africa.

As part of the project, up to 150 disabled people were interviewed in each of the countries of Malawi, Mozambique and India regarding their travel experiences. Findings from focus groups and from key informant interviews undertaken in the Cape Town area of South Africa by the Cape Metropolitan Council in 1998, were also included.[9]

Three types of barriers to accessibility (as illustrated in Fig. 2) were identified: namely structural, social and psychological. The issues raised around each barrier were surprisingly similar between countries and also to those found in the developed world.

4.1. Structural barriers

Generally, the design of public transport vehicles presents major obstacles of accessibility for disabled people. Problem areas highlighted included

(a) high entry steps with high risers (the distance from the ground to the first step is typically up to 50 cm on South African buses)
(b) lack of sufficient grab rails both at the entrance and within the vehicle
(c) lack of colour contrast
(d) slippery or split-level vehicle floor surfaces
(e) narrow aisles and seat spacing.

Together with vehicle design, inadequate infrastructure facilities present major structural barriers to the mobility of people with disabilities. Railway stations, bus stops and bus stations/terminals and the stops and ranks used by minibus-taxis are rarely designed with the needs of disabled people in mind.

The pedestrian environment in developing countries also presents major obstacles for disabled people. Most journeys begin and end on foot, yet uneven pavement surfaces, rubbish in the streets, vendors encroaching on footways, poorly
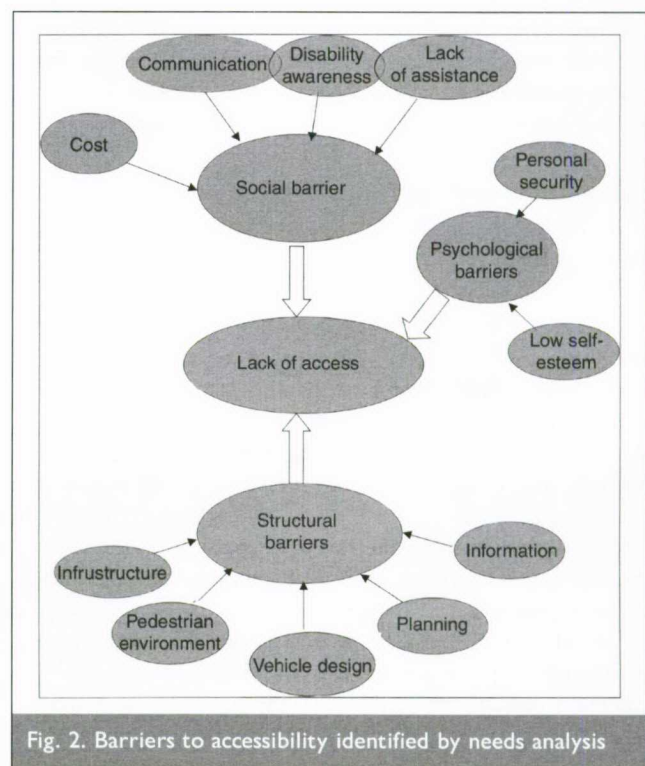

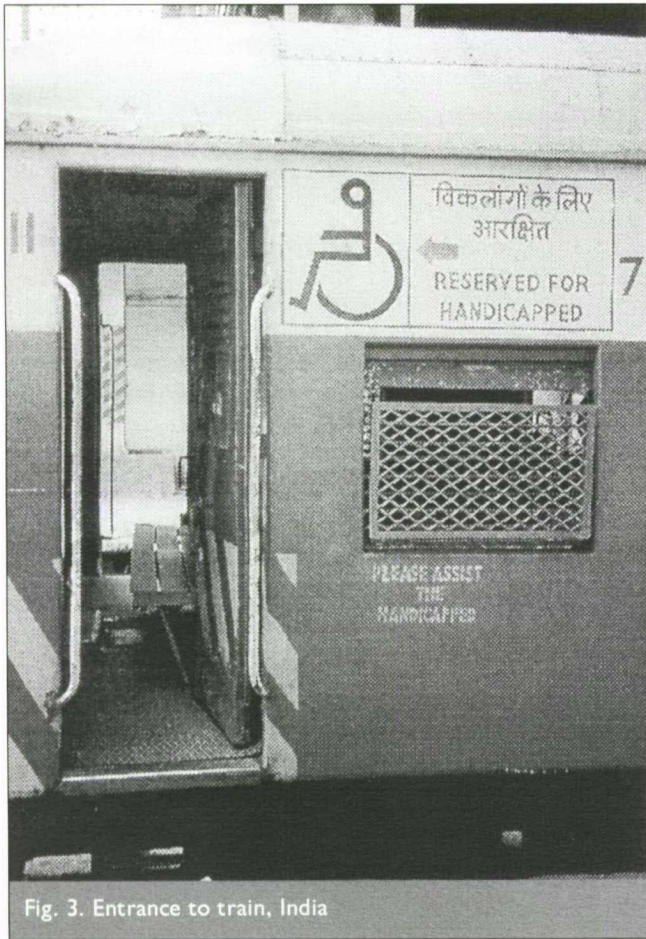Fig. 2. Barriers to accessibility identified by needs analysis
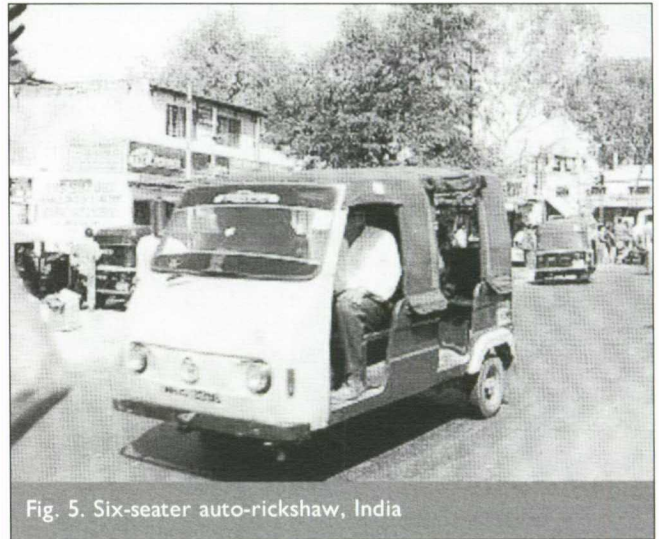
Fig. 3. Entrance to train, India

Fig. 5. Six-seater auto-rickshaw, India

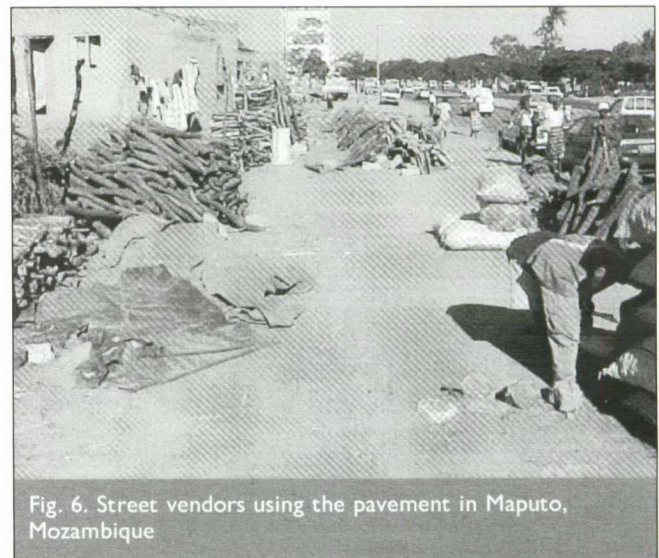Fig. 6. Street vendors using the pavement in Maputo, Mozambique

Fig. 4. Minibus-taxi, South Africa

designed street crossings and vehicles parked on footways all present hazards (see Fig. 6). Even natural conditions sometimes contribute to problems in the pedestrian environment, for example the steep gradients of streets and footways (such as in Blantyre, Malawi), and the very sandy conditions on unpaved streets in parts of Maputo, Mozambique. Both limit the use of wheelchairs.

Further to these more obvious problems, there are the sometimes less obvious obstacles: barriers to accessing information about transport were reported by people with all types of disabilities. People with sensory impairment often have difficulties identifying the correct vehicle to board, the correct fare to pay or the point at which to disembark. Operators frequently did not display route numbers or destination signs prominently and wheelchair users stated that timetables (if provided at all) were often placed too high for them to see.

Poor planning can also restrict access. In South Africa, participants highlighted a lack of coordination between feeder and primary transport, necessitating a long walk to the bus stop, rail station or minibus-taxi rank or when transferring between modes. Additionally, existing public transport services focused upon home-to-work trips with lack of access to other destinations such as medical care or education centres.

4.2. Social barriers
Social barriers are often overlooked but need to be considered if the full potential of structural improvements is to be realised.

Transport staff and other passengers can create barriers to access for disabled people. For example, participants reported that if assistance was provided, it was generally done in a demeaning or patronising way. As providers of a public service, operational staff play an important role as the interface between passengers and the service provided, yet general

ignorance about the needs of disabled people combined with negative attitudes towards them made many disabled people feel excluded from the service. In Malawi, 'call boys' who direct passengers to waiting minibus-taxis were reported as being abusive towards disabled people. Common practices such as skipping intermediate bus stops make it difficult for vision- and cognitive-impaired passengers to identify their stop. While the terrain in many countries may lead to an uncomfortable journey, drivers were reported to exacerbate the discomfort and pain experienced by fast acceleration and braking.

Hearing and speech impairments lead to difficulties in communicating with staff and other passengers. The prevalence of illiteracy among drivers, disabled people themselves and other passengers often limits the possibilities for writing down requests for tickets or other information.

As many disabled people are also impoverished, a major barrier to access to transport is cost. People with physical impairments, especially wheelchair users, were often limited to more expensive, accessible forms of transport. In India, for example, rickshaws were used by wheelchair users (those who could transfer to a seat) because they were more accessible than other cheaper services. Disabled people also reported being charged extra for transporting their mobility aids.

Where concessions were provided, participants reported problems using them, such as conductors refusing to allow disabled people to travel free with a bus pass. People with hearing impairment sometimes received verbal abuse when they failed to understand the request to see their bus pass.

4.3. Psychological barriers
Being self-conscious about their disability either prevented people from using some modes of transport or made them less inclined to ask for assistance. Concern about personal security was also a major barrier, particularly for disabled women. Participants were worried that drivers of auto-rickshaws and taxis would take them to the wrong destination or would cheat them. Concerns were also expressed about being a pedestrian in heavy traffic. Societies' lack of awareness, general negative attitude and ignorance of the constraints faced by disabled people when carrying out daily livelihood activities to sustain themselves and their families exacerbate these concerns.

5. IMPROVING ACCESS
While the above findings highlight a large number of problem areas, there is a growing political will in many developing countries to improve the situation for disabled people. India, Malawi, Mozambique and South Africa already have some form of legislative framework concerning, either directly or indirectly, the needs of disabled people. For example, in India, The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act 1995, instructs transport operators and government authorities to

(a) adapt rail compartments and buses to promote easy access to people with disabilities
(b) install auditory signals at road crossings
(c) install dropped kerbs and provide ramps to public buildings
(d) install tactile surfaces to warn vision-impaired people of the edge of railway platforms.

It is important, in defining and monitoring transport accessibility policies, to include all stakeholders, such as: administrators; transport regulators and planners, public transport operators; vehicle equipment and manufacturer suppliers; and NGOs or associations representing people with various disability impairments. This at least ensures that all aspects of disabled people's travel can be considered when planning transport improvements and new systems.

Improvements in vehicle design and infrastructure can be found in various parts of the developing world. Bus systems in Curitiba, Brazil and in Bogota, Columbia include a large number of stops with raised platforms served by ramps or lifts. Passengers board the buses at floor level using bridging devices that are automatically lowered as buses pull up to the stop. The use of stair lifts in subway stations in Sao Paulo and Buenos Aires has increased the stations' accessibility to physically disabled people. The experience in Latin America has shown that a small number of low-cost features can benefit the large majority of disabled passengers (see Fig. 7). Many newer vehicles designed to replace the existing Micro fleet in Mexico City feature wider steps, handrails for boarding, prioritised seats, high colour contrast on steps and a passenger complaint number painted in large print on the vehicle. Additionally, cities such as Mexico City, Rio de Janeiro and Pretoria have installed large numbers of dropped kerbs. In South Africa minibus-taxi drivers and passengers use a system of hand signals to denote destinations. This (unintentionally) benefits illiterate users and people with sensory impairments.

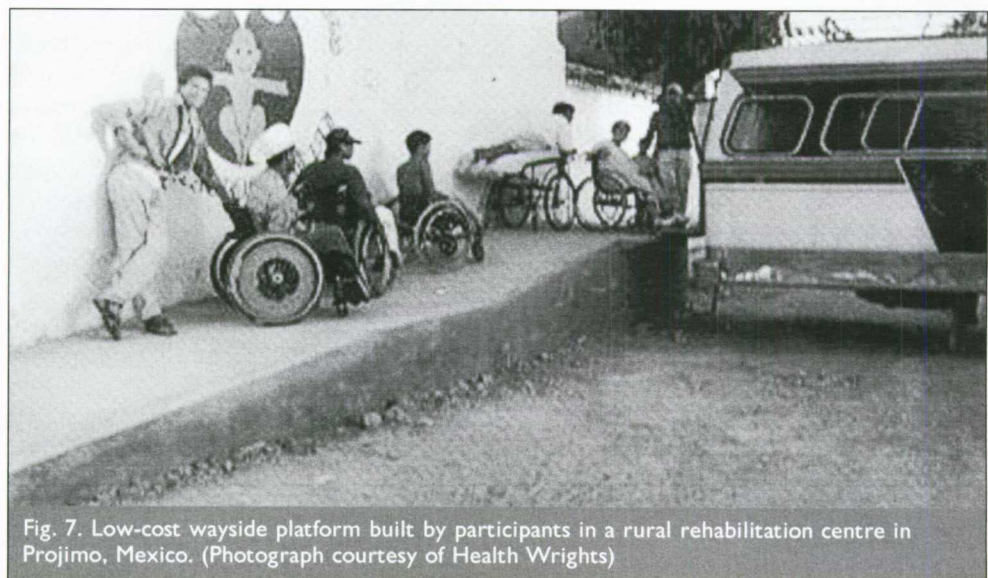There is also a wealth of researched solutions in the developed

Fig. 7. Low-cost wayside platform built by participants in a rural rehabilitation centre in Projimo, Mexico. (Photograph courtesy of Health Wrights)

world, some of which may well be applicable to countries that are less developed and constrained by financial resources. One particularly inexpensive yet important means of increasing access concerns the use of disability awareness training for transport staff to reduce the social barriers to access. Disability awareness/equality training can show transport employees the appropriate way to behave towards disabled customers and the language that should be used. A person with a disability often delivers the training and can explain the types of difficulty they encounter on a journey. Not only does this increase awareness of disabled people's needs but it also teaches staff how to assist disabled people in a way that is not demeaning.

Public transport management, transport planners, policy makers, traffic police, etc. can also benefit from disability awareness training by gaining an understanding of the issues faced by people with disabilities and the importance of addressing those issues.

One of the advantages of improving accessibility for people with disabilities is that inclusive design also benefits non-disabled passengers, by making transport systems easier to use. Hence *all* passengers benefit.

6. CONCLUSIONS

In summary, it is vital that the needs of disabled people are addressed if poverty alleviation strategies are to be successful in the developing world. Providing accessible transport is a pivotal step in the process of transport inclusion for disabled people. This involves removing social and psychological barriers experienced by disabled people in addition to the generally more obvious structural design features.

As might be expected, many of the issues found in the developing world are similar to those encountered in more developed countries. The latter, though increasingly addressing disabled people's needs, cannot claim to be totally successful and may learn from simple initiatives implemented in the developing world. On the other hand, not all of the solutions found to improve accessibility in the developed world (e.g. tactile warning surfaces on uneven footpaths) may be suitable for the developing world. Clearly the context in which measures are planned and implemented requires careful consideration. However, solutions such as disability awareness training programmes can easily be introduced in developing countries to increase awareness of the needs of people with disabilities among transport staff, managers, planners, designers and policy makers.

Having identified both the issues facing disabled people in four (representative) developing countries and the solutions that already exist in both the developed and developing world, the next phase of the project includes the implementation and monitoring of a number of low-cost solutions in India, Malawi, Mozambique and South Africa.

An important part of the project has been to utilise and develop relationships with local stakeholders, such as disability groups and transport operators. Following their participation in Phase 1 of the project, local stakeholders have taken a lead role in the identification and development of suitable demonstration projects. They have also been involved in workshops to disseminate the findings to date. Results of the demonstration projects will be incorporated into a Compendium of Guidelines and Standards, which will be disseminated at the end of the project to help enable stakeholders to increase accessibility to transport systems for disabled people.

7. ACKNOWLEDGEMENTS

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